

AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 9. This sheet, which includes Fig. 9, replaces the original sheet including Fig. 9. In Figure 9, reference character 40 has been added to identify read gates. No new matter is added.

Attachment: Replacement Sheet

REMARKS

Claims 1-9 are pending in this application, claims 10-14 having been withdrawn as claims directed to non-elected claims. Applicant reserves the right to file a divisional application directed to the subject matter of claims 10-14.

By this Amendment, new claims 15-17 are added. Also by this amendment, claims 3 and 6 are amended to correct minor, informal errors. No new matter is added by the amendments to claims 3 and 6 or by the addition of new claims 15-17. Thus, claims 1-9 and 15-17 are pending and subject to examination.

Applicant acknowledges with appreciation the Examiner's allowance of claims 7-9 and indication of allowable subject matter in claims 4 and 5.

Reconsideration of this application is respectfully requested in view of the foregoing amendments and following remarks.

Objection To The Specification And Drawings

In the Office Action mailed January 13, 2005, the title and disclosure of the specification were objected to. In addition, drawing Figure 9 was objected to. The title, disclosure and Fig. 9 have been amended responsive to these objections. If any additional amendments are necessary to overcome these objections, the Examiner is requested to contact the Applicant's undersigned representative at the telephone number listed below.

Claim 1 Recites Patentable Subject Matter

In the outstanding Office Action, claim 1 was rejected under 35 USC § 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter, "AAPA") in view of

EP No. 0 668 691 A1 to Brouwer et al. (hereinafter, "Brouwer"). Applicant hereby traverses the rejection, as follows.

Claim 1 is directed to a charge transfer device having a charge transfer path, a plurality of charge transfer electrodes and a first pulse signal generator circuit. The charge transfer device as recited in claim 1 includes, among others, a feature wherein the first pulse signal generator circuit applies either a first pulse signal train for n -phase (n being an integer larger than 1) driving of charges in the charge transfer path to the charge transfer electrodes or a second pulse signal train for $(n + 1)$ -phase driving of charges in the charge transfer path to the charge transfer electrodes. Thus, in the invention recited in claim 1, the length of a charge transfer stage may be changed, thereby preventing or reducing the number of empty charge transfers during a thinning operation.

The Office Action admits that the AAPA does not disclose the first pulse signal generator circuit for applying either a first pulse signal train for n -phase (n being an integer larger than 1) driving of charges in said charge transfer path to said charge transfer electrodes or a second pulse signal train for $(n + 1)$ -phase driving of charges in said charge transfer path to said charge transfer electrodes.

Brouwer is cited as allegedly curing the deficiencies of the AAPA.

Brouwer discloses a sensor matrix A and a memory matrix B for storing charges of the sensor matrix A. Charges of the memory matrix B are transferred to the horizontal output register 4. Although Brouwer discloses a 3-phase or 4-phase CCD to enable switching between a 4/3 and 16/9 aspect ratio, Brouwer specifically discloses, in contrast to claim 1, operating the memory matrix B and the horizontal output register 4

as a 4-phase CCD, regardless of the operating mode of the sensor matrix A. Thus, a horizontal charge transfer stage of Brouwer is fixed, and at least the changeable length charge transfer stage feature of the invention, as claimed in claim 1, cannot be realized by Brouwer.

To establish *prima facie* obviousness of a rejected claim, the applied art of record must teach or suggest each feature of a rejected claim. See *M.P.E.P.* §2143.03. As explained above, Brouwer neither discloses nor suggests each and every feature of independent claim 1. Thus, Applicant respectfully submits that independent claim 1 is neither anticipated nor rendered obvious by Brouwer. Accordingly, Applicant respectfully submits that independent claim 1 is patentably distinct over Brouwer and in condition for allowance.

Withdrawal of the rejection of claim 1 is respectfully requested.

Claim 2 Recites Patentable Subject Matter

Claim 2 was rejected under 35 USC § 103(a) as being unpatentable over the AAPA in view of US Patent No. 6,211,507 to Kawai (hereinafter, "Kawai"). Applicant hereby traverses the rejection, as follows.

Claim 2 is directed to a charge transfer device having a charge transfer path, a plurality of charge transfer electrodes and a second pulse signal generator circuit. The charge transfer device as recited in claim 2 includes, among others, a feature wherein the second pulse signal generator circuit applies either a first pulse signal train for n-phase driving (n being an integer larger than 1) of charges in the charge transfer path to the charge transfer electrodes or a third pulse signal train for (n x m)-phase driving (m being an integer larger than 1) of charges in the charge transfer path to the charge

transfer electrodes. Thus, in the invention recited in claim 2, the length of a charge transfer stage may be changed, thereby preventing or reducing the number of empty charge transfers during a thinning operation.

The Office Action admits that the AAPA does not disclose the second pulse signal generator circuit as recited in claim 2.

Kawai is cited as allegedly curing the deficiencies of the AAPA.

Kawai discloses one horizontal charge transfer electrode per column of vertical charge transfer electrodes, to which is applied a signal $\Phi H1$. Thus, a horizontal charge transfer stage of Kawai is of a fixed length, and at least the changeable length charge transfer stage feature of the invention, as claimed in claim 2, cannot be realized by Kawai.

To establish *prima facie* obviousness of a rejected claim, the applied art of record must teach or suggest each feature of a rejected claim. See *M.P.E.P.* §2143.03. As explained above, Kawai neither discloses nor suggests each and every feature of independent claim 2. Thus, Applicant respectfully submits that independent claim 2 is neither anticipated nor rendered obvious by Kawai. Accordingly, Applicant respectfully submits that independent claim 2 is patentably distinct over Kawai and in condition for allowance.

Withdrawal of the rejection of claim 2 is respectfully requested.

Claim 3 Recites Patentable Subject Matter

Claim 3 was rejected under 35 USC § 103(a) as being unpatentable over the AAPA in view of Kawai and in view of US Patent No. 6,075,565 to Tanaka et al. (hereinafter, "Tanaka"). Applicant hereby traverses the rejection, as follows.

Claim 3 is directed to a charge transfer device having a charge transfer path, a plurality of first and second charge transfer electrodes, a plurality of charge transfer pairs and a third pulse signal generator circuit. The charge transfer device as recited in claim 3 includes, among others, a feature wherein the third pulse signal generator circuit applies either a fourth pulse signal train of two-phase for 2-phase driving of charges in the charge transfer path to two charge transfer electrode pairs or a fifth pulse signal train for 2k-phase driving or more of charges in the charge transfer path to the charge transfer electrode pairs. Thus, in the invention recited in claim 3, the length of a charge transfer stage may be changed, thereby preventing or reducing the number of empty charge transfers during a thinning operation.

The Office Action admits that the AAPA does not disclose the third pulse signal generator circuit as recited in claim 3.

Tanaka is cited as allegedly curing the deficiencies of the AAPA.

Tanaka discloses only one horizontal charge transfer electrode per charge transfer column, as opposed to two adjacent charge transfer electrodes being connected together to make charge transfer electrode pairs, as recited in claim 3. Further, Tanaka discloses applying a signal $\Phi H1$ or $\Phi H2$ for two-phase driving of charges in the horizontal charge transfer path only, in contrast to claim 3. Thus, a horizontal charge transfer stage of Tanaka is of a fixed length, and at least the changeable length charge transfer stage feature of the invention, as claimed in claim 3, is not realized.

To establish *prima facie* obviousness of a rejected claim, the applied art of record must teach or suggest each feature of a rejected claim. See *M.P.E.P.* §2143.03. As

explained above, Tanaka neither discloses nor suggests each and every feature of independent claim 3. Thus, Applicant respectfully submits that independent claim 3 is neither anticipated nor rendered obvious by Tanaka. Accordingly, Applicant respectfully submits that independent claim 3 is patentably distinct over Tanaka and in condition for allowance.

Withdrawal of the rejection of claim 3 is respectfully requested.

Claims 4-6 Recite Patentable Subject Matter

Claims 4 and 5 were objected to only as depending from a rejected base claim, i.e., claim 3. Claim 6 also depends from claim 3. The Applicant submits that claims 4-6 are allowable for the same reasons as claim 3, as well as for the additional subject matter recited therein. Accordingly, withdrawal of the objection to claims 4 and 5 and allowance of claims 4-6 are respectfully requested.

Allowed Claims 7-9

Applicant acknowledges with appreciation the allowance of claims 7-9 in the outstanding Office Action.

New Claims 15-17 Recite Patentable Subject Matter

New claims 15-17 depend from claims 1, 2, and 3, respectively. Thus, new claims 15-17 are allowable for the same reasons as claims 1, 2, and 3, as well as for the additional subject matter recited therein. Accordingly, a notice of allowability of claims 15-17 is earnestly solicited.

With regard to each of the rejections under §103 in the Office Action, it is also respectfully submitted that the Examiner has not yet set forth a *prima facie* case of obviousness. The PTO has the burden under §103 to establish a *prima facie* case of

obviousness. In re Fine, 5 U.S.P.Q.2nd 1596, 1598 (Fed. Cir. 1988). Both the case law of the Federal Circuit and the PTO itself have made clear that where a modification must be made to the prior art to reject or invalidate a claim under §103, there must be a showing of proper motivation to do so. The mere fact that a prior art reference could arguably be modified to meet the claim is insufficient to establish obviousness. The PTO can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. Id. In order to establish obviousness, there must be a suggestion or motivation in the reference to do so. See also In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (prior art could not be turned upside down without motivation to do so); In re Rouffet, 149 F.3d 1350 (Fed. Cir. 1998); In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999); In re Lee, 277 F.3d 1338 (Fed. Cir. 2002).

In the Office Action, the Examiner merely states that the present invention is obvious in light of the cited references. See, e.g., Office Action at page 4. This is an insufficient showing of motivation.


Conclusion

For all of the above reasons, it is respectfully submitted that claims 1-9 and 15-17 are in condition for allowance and a Notice of Allowability is earnestly solicited.

Should the Examiner determine that any further action is necessary to place this application into condition for allowance, the Examiner is invited to contact the undersigned representative at the telephone number listed below.

In the event this paper is not considered to be timely filed, Applicant hereby petitions for an appropriate extension of time. The Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment associated with this communication to Deposit Account No. 01-2300 referencing docket number **107317-00017**.

Respectfully submitted,
ARENT FOX PLLC


Michele L. Connell
Registration No. 52,763

Customer No. 004372
1050 Connecticut Avenue, N.W.,
Suite 400
Washington, D.C. 20036-5339
Tel: (202) 857-6104
Fax: (202) 857-6395

MLC:sg
Enclosure: Replacement Sheet